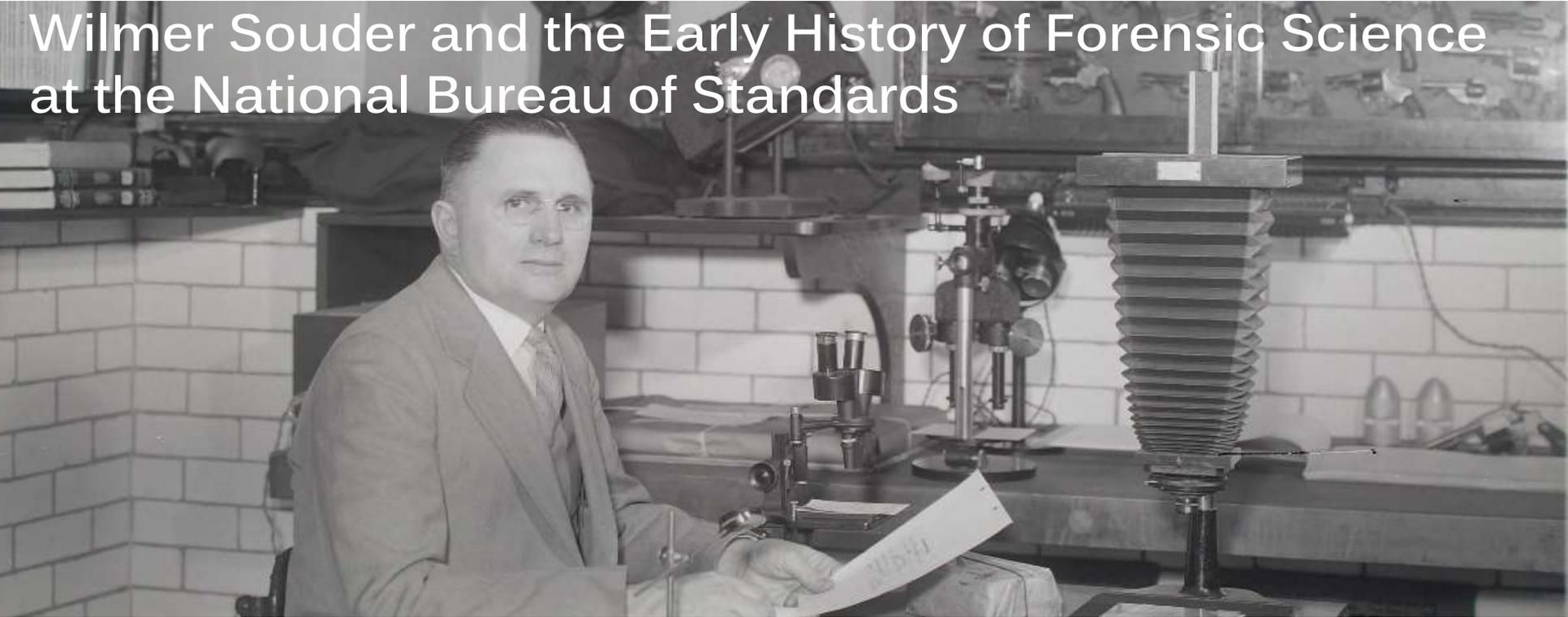


The Best Forensic Scientist You've Never Heard Of

Wilmer Souder and the Early History of Forensic Science at the National Bureau of Standards



NIST
National Institute of
Standards and Technology
U.S. Department of Commerce



Kristen M. Frederick-Frost, PhD

Robert M. Thompson, BS

John M. Butler, PhD

LW1: Last Word Society
American Academy of Forensic Sciences
Las Vegas, NV (February 25, 2016)

NIST FORENSIC SCIENCES



Individuals	Affiliation or Role	Assistance provided
Mark Falzini	New Jersey State Police Archivist	NJSP memos related to the Lindbergh kidnapping case
John Fox	FBI Historian	FBI memos related to early FBI Laboratory
Caleb Gills	NIST summer intern	Initial review of notebooks
Kathy Leser	Souder's granddaughter and only living direct relative	Shared photos, articles, July 1951 <i>Reader's Digest</i> , ...
Jason Long & Barbara Osteika	ATFE Laboratory Librarian & ATFE Historian	Located "new" Souder book in ATFE holdings
Patricia Manzollilo	US Postal Service Laboratory	USPS records on Souder
Michael Sampson & Kathleen Storer	US Secret Service Archives and Laboratory	Transcript of Souder's talk at 1941 USSS conference
Adiva Sotzsky	Former ATFE Librarian (National Laboratory Center)	Preserved Souder notebooks and returned them to NIST in 2003
Peter Tytell	Questioned documents & typewriter examiner	Historical perspective; some helpful articles about Souder
Billy Wade	National Archives (Photographic Division)	Enabled scans of Souder photos from NBS collection

Examples of handwriting used for identification, May 1929
NBS records held by NARA

Chairman
Federal Specifications Board,
Bureau of Standards
Washington, D.C.

Bureau of Standards
Washington
D.C.

Bureau of Standards
Washington
D.C.

Bureau of Standards
Washington
D.C.

Department of Commerce
Bureau of Standards
Constitution Ave
Washington D.C.

Bureau of Standards
U.S. Dept. of Commerce
Washington,
D.C.

Examples of typewriting used for identification, May 1929

NBS records held by NARA

Washington, D.C.

Washington, D. C.

Washington, D. C.

U.S. Bureau of Standards,
Washington D.C.

BUREAU OF STANDARDS
COMMERCE DEPARTMENT
WASHINGTON, D. C.

U. S. Department of Commerce
Bureau of Standards
Washington D. C.

Director, Bureau of Standards,
Washington, D. C.

Bureau of Standards,
Washington, D.C.

Bureau of Standards
Washington, D.C.

Department of Commerce
Bureau of Standards
Washington, D. C.

Bureau of Standards
Departement of Commerce

Washington

Bureau of Standards,
Washington, D. C.,
U.S.A.

Washington D C

Bureau of Standards

The National Bureau of Standards,
Washington, D. C.

Bureau of Standards
Washington, D.C.

Bureau of Standards,
Washington, D. C.

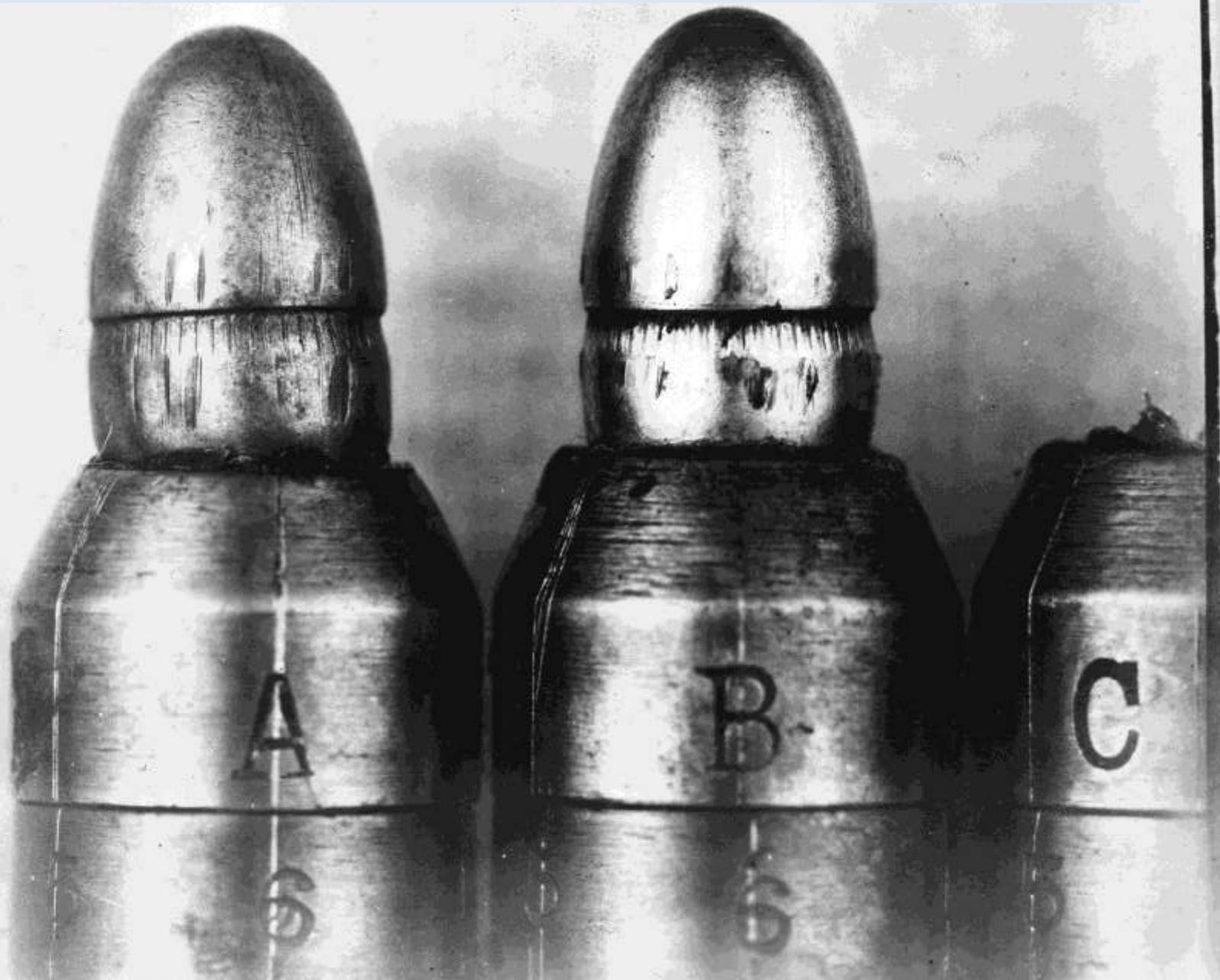
Director of Bureau of Standards,
Washington, D. C.

Bureau of Standards,
Washington, D. C.

Bureau of standards,
Washington, D. C.

Bullets and shells used for identification, December 1928

NBS records held by NARA



Handwriting identification for Dept. of Justice, February 1930
 NBS records held by NARA

To the Bureau of Nav.

Dear Sirs.

I would like to submit you this matter.

I am going to kill myself to night, and please for my six months pay I would like you to deliver to this woman as I love her very much, and till the end of my life.

Very truly yours

Eleno Quismorio
 Eleno Quismorio

Her address
 Miss Marie Eburgen
 6022 Hartford Road
 Hamilton Road
 Md.

To the Bureau of Nav.

Dear Sirs
 Before

Dept Justice
 2-28-30

I do solemnly swear (or affirm) that the facts stated and disclosed in the foregoing are true to the best of my knowledge and belief.

Eleno Quismorio *Eleno Quismorio*

Miss Attendant lat elen *E. Quismorio*

Recruited and sworn to before me this 18th day of May 1929 having authority to administer oaths *W.F. Halsey*

W.F. Halsey
 W. F. HALSEY, Captain, USN.

U.S.S. REINA MERCEDES

Training Office, USS REINA MERCEDES

DATE AND NATURE OF ANY WAIVER

I agree to submit to treatment for the prevention of smallpox, typhoid (typhoid prophylaxis), and to such other procedures as may be considered necessary by the Naval authorities.

Eleno Quismorio
 Signature of recruit, in his own handwriting.

E. Quismorio
 Signature and rank of the recruiting officer.

Total net service for pay purposes 7 years 5 months 09 days

Eleno Quismorio
 Signature of man.

Leo A. Kestner
 Leo A. KESTNER, Lieut (jg)

INSTRUCTIONS
 This form must be sworn to before an officer of the United States Navy or Marine Corps, and the signature of the officer must be countersigned by the commanding officer of the vessel or shore establishment to which the recruit is assigned.

Handwriting identification for Dept. of State, November 1934

NBS records held by NARA

are
found very
George J. [unclear]
[unclear]

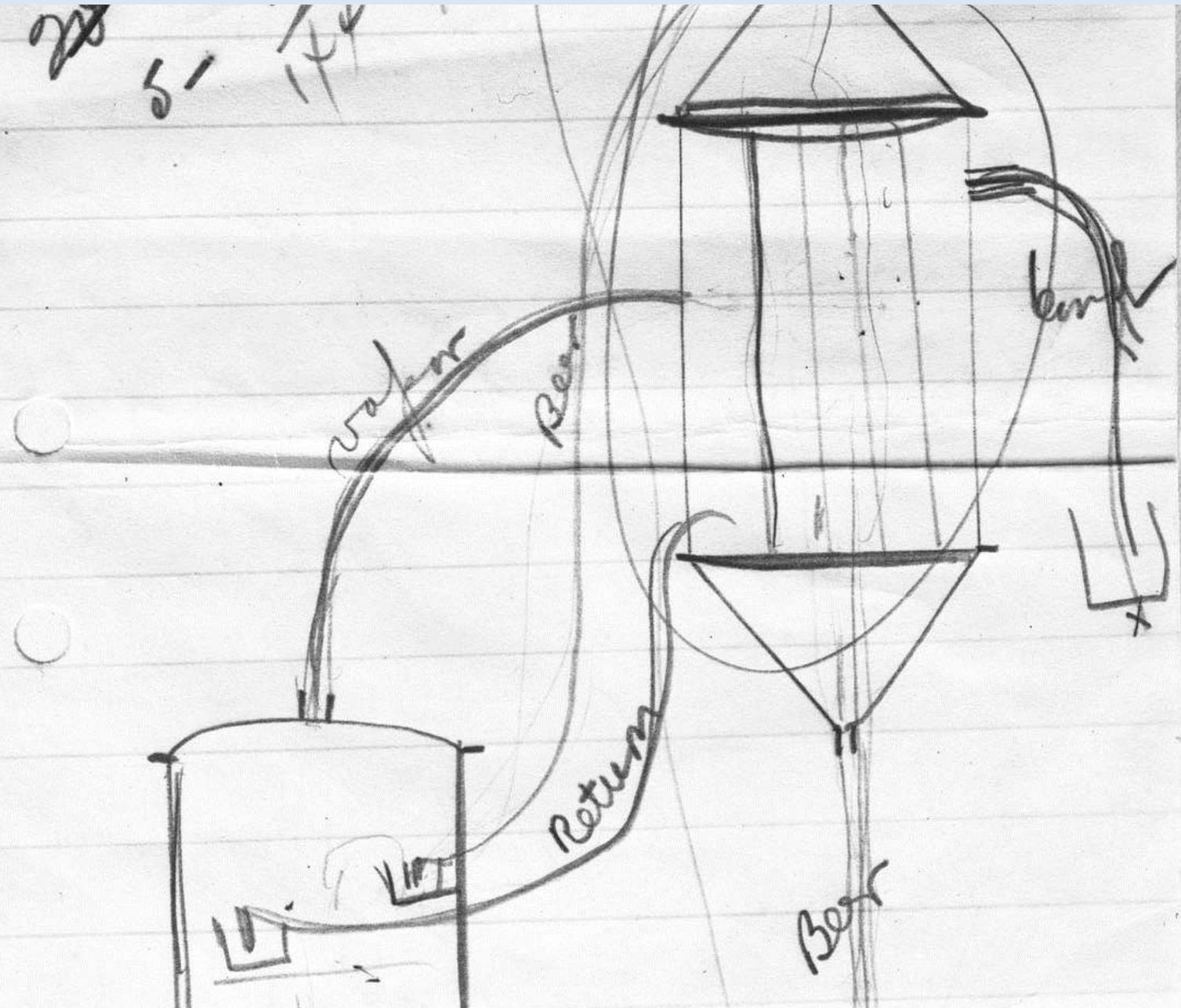
Department of State

Nat. Bur. Std's T 73166
11/20/34

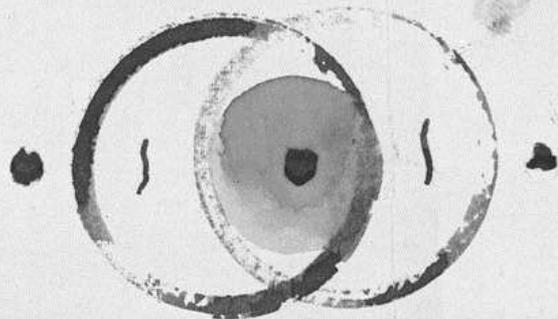


Handwriting identification for Bureau of Prohibition, March 1930
NBS records held by NARA

4
5
6
7
8
9
10
11
12
13
14
15
16



line. 100 feet from the last station
on the left side is a empty park
further stand with a big open porch
around, you will find a noise in
center of the porch underneath a stone
this noise will tell
you were to find us.



Act accordingly.

after $\frac{3}{4}$ of a hour be
on the place. bring the money with you.

Ideals for firearm identification

There should be adopted:

1. Minimum standards of equipment to be used.
2. Standards for records of evidence to accompany and substantiate the expert's opinion; these to include photographs, metrological data and interpretations in permanent form.
3. Standards for qualification of experts which will include actual tests made against secretly designated materials and reported in compliance with item 2.
4. Methods for... following up [with] experts testifying in court to guarantee the highest efficiency.

Wilmer Souder, Army and Navy Journal, March 19, 1932

A N N U A L C O N F E R E N C E

U.S. Secret Service Conference

UNITED STATES SECRET SERVICE

TREASURY DEPARTMENT

January 6, 7, 8, 9, 1941



Fairfax Room

Willard Hotel

Washington, D. C.

WALTER H. HICKMAN

Stenotype Reporter

Wilmer Souder's Impact in His Day

“This country is indeed fortunate in having a man such as Dr. Souder in his capacity. I think we can look upon him as **the most outstanding expert on the continent in the last one hundred years.**”

-Deputy Chief Inspector John J. O'Connell, **New York City Police Department**, after Souder's keynote talk

Rediscovery of Wilmer Souder's Notebooks

*Transferred to NIST Archives in 2003
by Alcohol, Tobacco, Firearms, and Explosives Laboratory*



Detailed analysis started in May 2015

Content of Souder Notebook Entries

- Date for Evidence Submission
- NBS Test Number
- Submitting Agency
- Submitting Agent
- Summary of Findings
- Disposition of evidence (chain-of-custody)
- Case court outcome if known
- Newspaper Clippings from cases

NBS: National Bureau of Standards (name changed to NIST in 1988)

1931 Work to Help Indict a Gang Associated with Al Capone

6-22-31

1044
Investment
Block

Mr. H. H. Mark
Wiped claims Commission
U.S. & Germany

3 documents Re-application
(Handwritten by Stein)
to Waters & Scribner

? Steins on page
? not with - no copy
Army Intell.

Protectors for record of
Polish - Warman

Mr Arnold with 2235 period
to Scribner

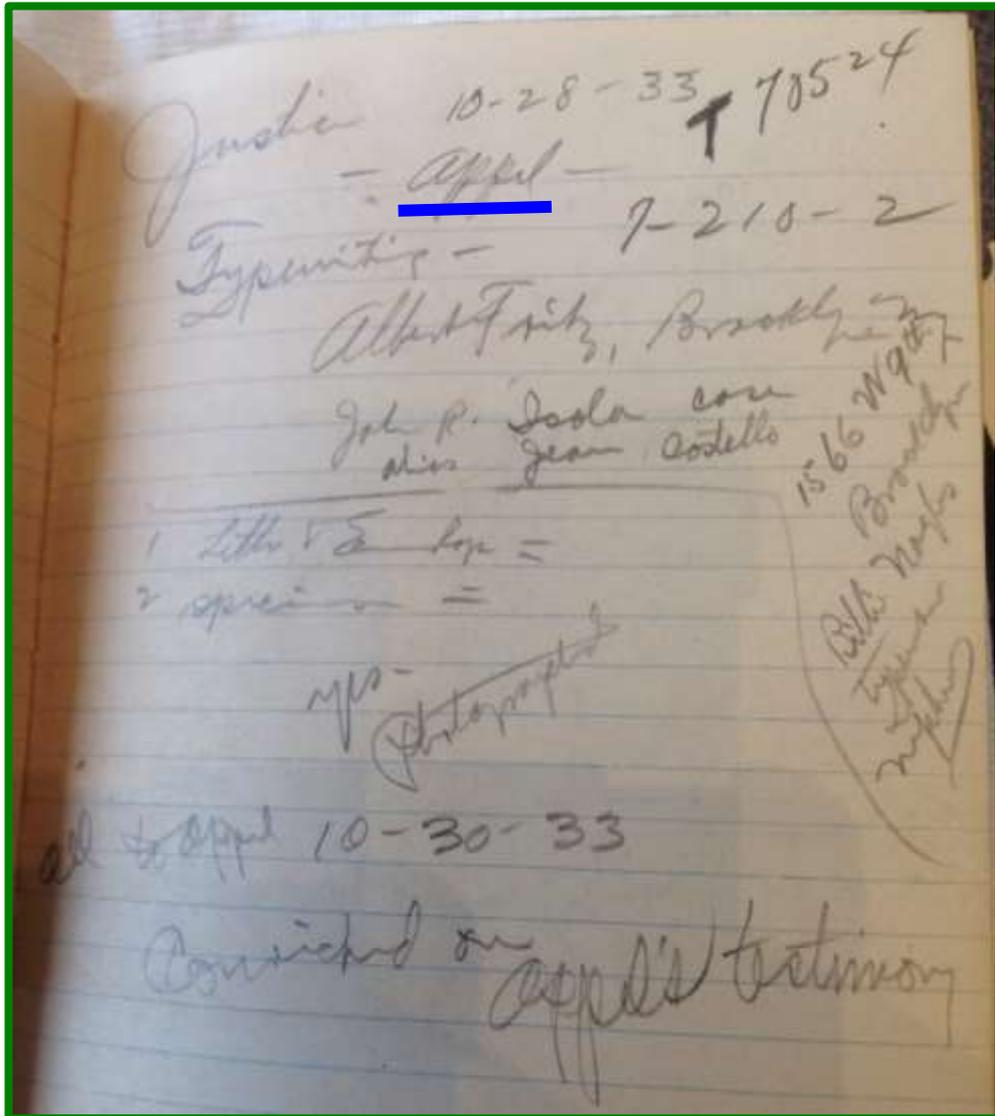
Recd Justice Probi
5-22-31 mail
Jones -
Case 236-5
Mar 6 400 B/285
PH CSA 12PM
Bureau N.D. La

March 25, 1931 Bureau
March 11, 1931 " JH
Corrected check March 25, 1931
Apr 15 1931 Bureau Bureau
July 17 1931 Project Law Station -
Type spec and Std # 1260772

Report agrees 5-26-31
Photocopies (orig. 2x)
material to Steins 7-2-31

Labon - Had. J. 25 1932
Bundled NO 2-2-32 - 184 labeled
Evidence improperly secured
must be returned to defendant
i. Out

A page from one of Wilmer Souder's notebooks (rediscovered June 2015)



Typewriting casework received from the Department of **Justice** – Charles **Appel** (first FBI Laboratory employee) on October 28, 1933 (10-28-33)

All [material returned] to **Appel** on October 30, 1933 (10-30-33)

Convicted on Appel's testimony

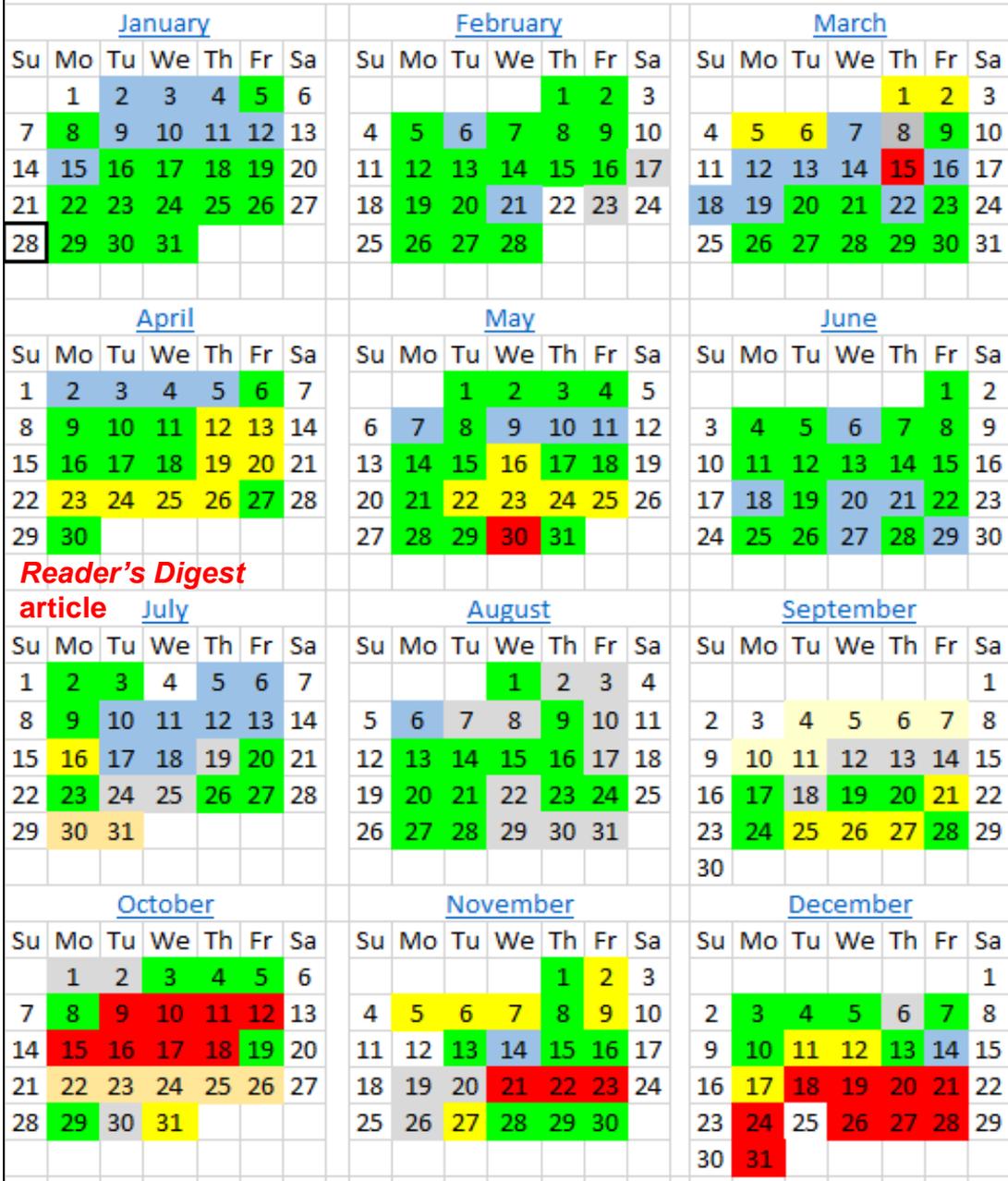
Log July 1950

Log Book from the end of Wilmer Souder's career at the National Bureau of Standards (July 1950 to February 1954), which **details his daily activities**

LABORATORY
RECORD
BOOK

U.S.
DEPARTMENT
OF
COMMERCE
—
BUREAU
OF STANDARDS
JOURNAL
KEEPED BY
MEMBERS

1951



Summary of information from Souder's logbook that tracked his daily activities

65%

32 days
120 days

45 days
26 days
13 days
22 days
6 days

Legend	
Yellow	forensic
Green	forensic + other
Blue	dental
Gray	general
Gold	conference
Red	annual/sick leave
White	holiday

261 week days total

Number of Cases Worked by Wilmer Souder based on entries in his notebooks

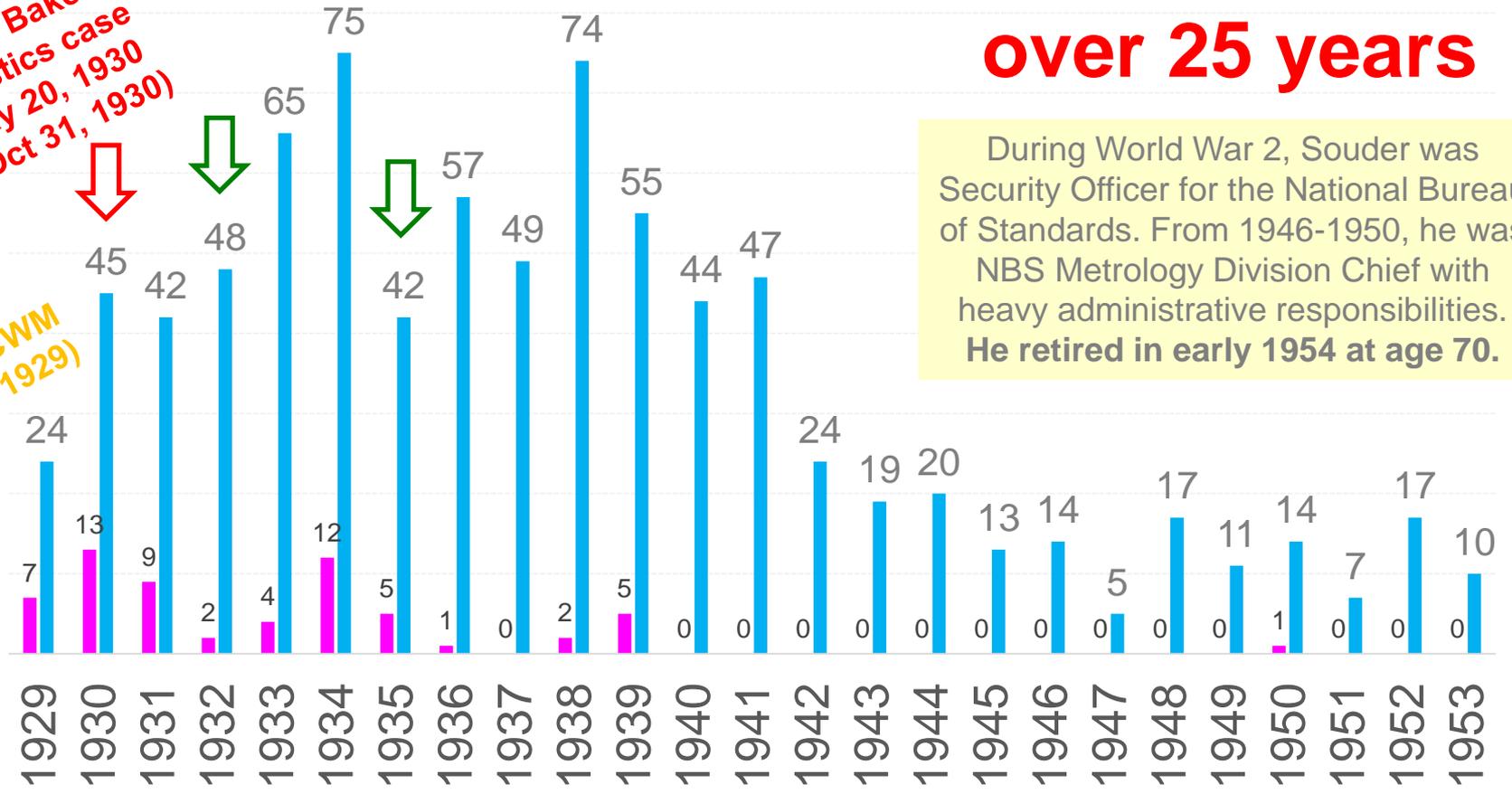
**838 cases
over 25 years**

Lindberg baby kidnapping
ransom note evaluations
(May 9, 1932 & Jan 16, 1935)

Mary Baker
ballistics case
(May 20, 1930
& Oct 31, 1930)

Talk at NCWM
(June 5, 1929)

During World War 2, Souder was Security Officer for the National Bureau of Standards. From 1946-1950, he was NBS Metrology Division Chief with heavy administrative responsibilities. He retired in early 1954 at age 70.



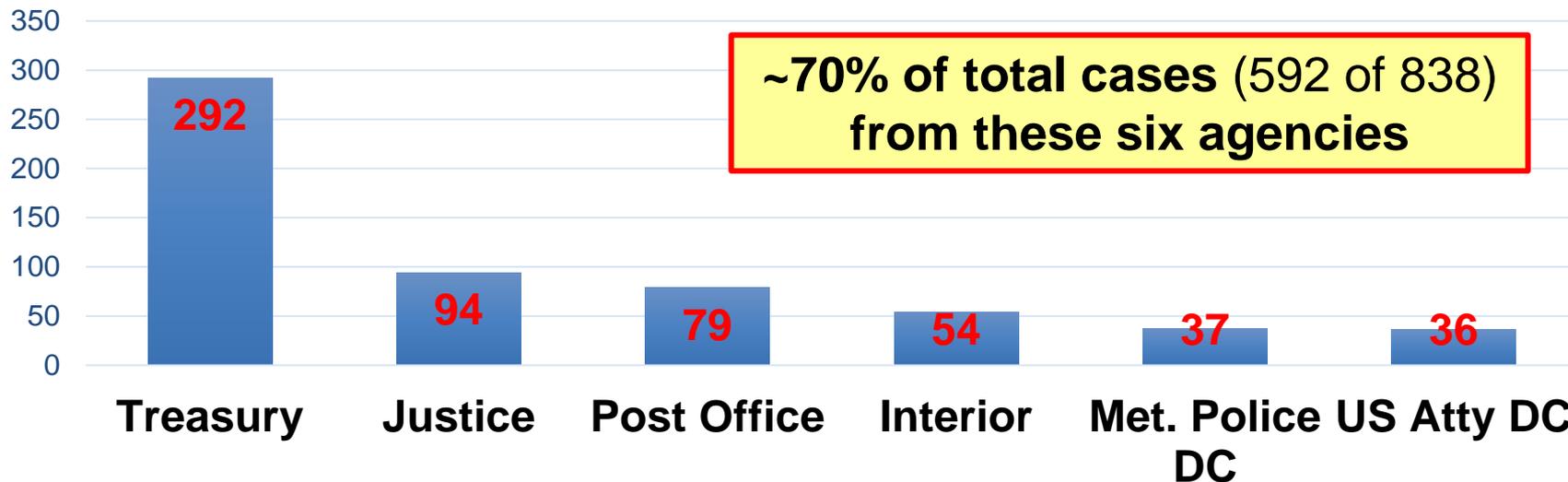
FBI Laboratory
begins operation
(Nov 24, 1932)

■ # ballistics ■ Total Cases

Submitting Agencies

(Handwriting, Typewriting, and Ballistics Casework)

Total Number of Cases Submitted (1929-1953)



Remaining 30% of cases were from >75 additional agencies including:

Census Bureau
Civil Service
Department of Agriculture
Department of Commerce
House of Representatives
Library of Congress
Senate Judiciary Committee
State Department

DC Health Department
DC Office of Weights & Measures
DC Supreme Court
National Labor Relations Board
New York Police Department
Office of Civil Defense
Patent Office
Security & Exchange Commission

Bureau of Prisons
Federal Housing Admin.
Federal Trade Commission
General Accounting Office
Government Printing Office
Military Intelligence Division
US Secret Service
War Department

Photographs of Wilmer Souder and His National Bureau of Standards Identification Laboratory

Circa 1925



From NIST files

11 April 1935



Rediscovered at National Archives (5 August 2015)

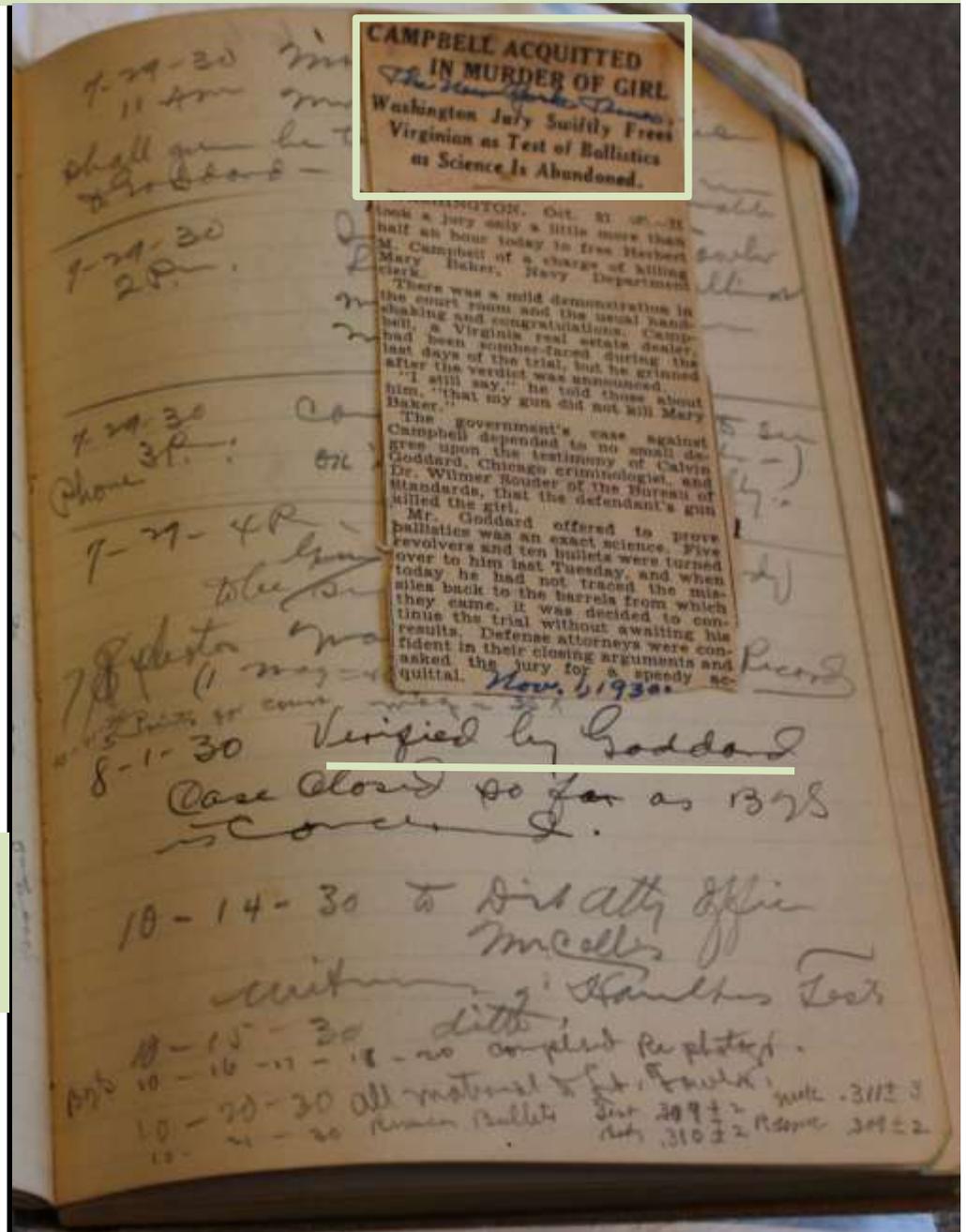
Mary Baker Case 1930

ATTACKED AND MURDERED



NAVY CLERK'S BODY STUFFED INTO CULVERT

Washington
Post,
April 13, 1930



Mary Baker Case 1930

Washington Evening Star, October 27, 1930

Enlargements Shown.

The photographs submitted by Dr. Souder appeared to be more intelligible to lay members of the jury than any other bullet photographs so far shown them. Comparison of the scratches were shown on certain photographs introduced by Col. Goddard Friday by means of superimposing portions of photographed test bullets on photographs of the fatal slugs, whereas the Bureau of Standard pictures showed the jury enlargements of the actual scene which would greet their eye if they looked into the special comparison microscope. The photographs appeared to represent one bullet, with a black line around the circumference at the center.



One of five composite land impressions displayed by Souder | top image from body (B); bottom image from test (T)

Lindbergh Case 1932-1935

Charles A. Lindbergh, Jr. born June 22, 1930

1932

← Kidnapping (March 1)

← Ransom Paid (April 2)

← Body Found (May 12)

Souder examines ransom letters in Hopewell, NJ (April 1)

1933

● Discovered documents regarding Souder's examination of handwriting

← ●

← ●

1934

← ●

← ●

← Hauptmann Arrest (Sept 19)

8,000—10,000 documents examined

1935

← Trial Begins (Jan 2)

← Trial Ends (Feb 14)

Souder testifies (Jan 16)

Hauptmann executed April 3, 1936



Lindbergh Case 1932-1935

1932 — Charles A. Lindbergh, Jr. born June 22, 1930

- ← Kidnapping (March 1)
- ← Ransom Paid (April 2)
- ← Body Found (May 12)

May 9-14, 1932
Lieut. R. A. Snook at NBS

1933

- Examination and photography of notes
- Fabrication of alphabet key

1934

- Coded as Adamson Case/T-67194

← Hauptmann Arrest (Sept 19)

1935

- ← Trial Begins (Jan 2)
- ← Trial Ends (Feb 14)

Hauptmann executed April 3, 1936



Box of Ransom Note Negatives (May 9, 1932), NARA

FBI Laboratory and Wilmer Souder 1934

1932

Charles A. Lindbergh, Jr. born June 22, 1930

- ← Kidnapping (March 1)
- ← Ransom Paid (April 2)
- ← Body Found (May 12)

1933

← FBI Lab
(Nov 24)

Suggested equipment
and arrangement of
laboratory

Reviewed lab findings

Provided training for
agents

1934

Souder
advisor to
FBI laboratory

Typewriting identification for Division of Investigation Jan 12, 1934, NARA

← Hauptmann Arrest (Sept 19)

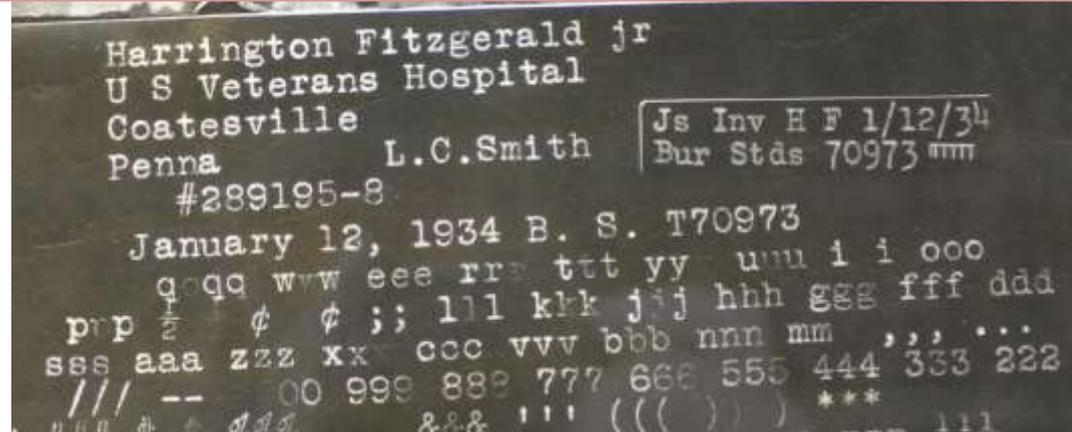
1935

- ← Trial Begins (Jan 2)
- ← Trial Ends (Feb 14)

Hauptmann executed April 3, 1936



NBS comparison microscope for bullets 1933, NARA



Summary & Lessons Learned

- A study of Wilmer Souder has revealed that **NIST has a more extensive history in forensic science (with casework experience) than previously appreciated**
 - Prior to this project, we had a single paragraph in a footnote of a book on NIST history describing Souder's activities in early forensic science
- **High-quality scientists can make a difference** in the quality of work performed in forensic science
- **What are we recording today in our work** to capture the history of our efforts to change and improve the practice of forensic science in our day?

Graduate Work at the University of Chicago

Published in *Physical Review* (Sept 1916), 8(3): 310-320

The University of Chicago

THE NORMAL PHOTOELECTRIC EFFECT
OF LITHIUM, SODIUM AND POTAS-
SIUM AS A FUNCTION OF WAVE-
LENGTH AND INCIDENT
ENERGY

A DISSERTATION

SUBMITTED TO THE FACULTY OF THE ODGEN GRADUATE SCHOOL
OF SCIENCE IN CANDIDACY FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

(DEPARTMENT OF PHYSICS)

BY

WILMER HENRY SOUDER

- Wilmer Souder completed his PhD dissertation in April 1916
- **Souder's graduate work on the photoelectric effect** verified Albert Einstein's 1905 theory and helped Robert Millikan receive the 1923 Nobel Prize in Physics
- Robert Millikan and Wilmer Souder published two articles together:
 - 1) Millikan, R.A. and Souder, W.H. (1914) Effect of residual gases on contact E.M.F.'s and photo-currents. *The American Physical Society* 4(1):73.
 - 2) Millikan, R.A. and Souder, W.H. (1916) Experimental evidence for the essential identity of the selective and normal photo-electric effects. *Proc. Natl. Acad. Sci.* 2:19-24.

DR. WILMER SOUDER
NATIONAL BUREAU OF STANDARDS
WASHINGTON

NOV 20 Recd
11-24-23.

11-24-1923

Dear Dr. Millikan:

I am enclosing a clipping from today's Herald. I want to tell you how proud I am to learn of the award.

Really I believe I have grounds for personal pride, since I can claim two prize winners as former teachers.

Sincerely,
Wilmer Souder

Dear Dr. Millikan,

I am enclosing a clipping from today's Herald. I want to tell you how proud I am to learn of the award.

Really I believe I have grounds for personal pride, since I can claim two [Nobel] prize winners as former teachers.

Sincerely,
Wilmer Souder



Wisdom of Wilmer Souder

National Bureau of Standards (1911-1913, 1917-1954)

“The honest expert never looks upon the outcome of his work as a result of luck, the reward of a game, or victory in a battle of wits. He has built his qualifications through hard work. He establishes his conclusions through exacting procedures; he presents his testimony in the face of keen opposition and asks no favor beyond an honest consideration of the facts disclosed. Having done so, he has fulfilled the high obligations of his profession.

“Justice is sometimes pictured as blindfolded. However, scientific evidence usually pierces the mask.”

- **Wilmer Souder**, “Effective Testimony for Scientific Witnesses”, *Science* (1954) 119: 819-822

Become an Honorary Souder Buff!

- We are looking for any information about early forensic laboratories and their possible intersection with Wilmer Souder and the National Bureau of Standards
- Please contact us at john.butler@nist.gov if you have any information to share

Thanks for your attention!